How Shimla got electricity early in the 20th century

The summer capital of British India had an acute water shortage, and electricity was needed to lift water with pumps. A hydel station at Chaba resolved the crisis

(Shimla's first powerhouse at Chaba, in May 2004)

Abhilash Gaur

By the 1880s Shimla had electricity, but it was such a rare treat that even the

viceroy, the most powerful man in India, had to use it sparingly.

When Lord Dufferin and his family moved into the brand-new Viceregal Lodge (now Indian Institute of Advanced Study) at Shimla, in July 1888, they didn't have enough electricity to turn on all the lights at once.

(The Viceregal Lodge at Shimla, in August 2006)

"The upper part of the house is usually left in darkness when the lower is fully lighted, as the batteries are not strong

enough to light up the whole brilliantly at once," says an entry dated September 15, 1888, in the journal 'Indian Engineering'.

That was alright. People were so used to their candles and fireplaces that electric lights were more of a party trick. There was no pressing need to install more dynamos for lights.

But there was another problem that soon pushed the administration to build a power station for Shimla – the scarcity of water in summer.

Parched capital

Shimla was cool and scenic, which is why the British had made it their summer capital. But it simply didn't have enough water for all the people who descended upon it in the season. The local stream used to run dry, almost.

“The supply at times becomes so scanty that people have to wait an hour or more to fill their vessels, and European families have been sometimes put on an allowance,” says W H Carey’s ‘A Guide to Simla’, published in 1870.

(Shimla’s water shortage had started in the 1860s)

The administration had built a pumping station on another small stream at a place called Cherot on old Shimla’s outskirts. It had a steam-powered pump, but by the 1890s this pump was inadequate. And adding another steam

engine would have meant carting more coal from the plains, which was not economical.

The obvious solution was to use hydroelectricity. The Satluj, a major river of Punjab, flowed in a valley to Shimla's west. The Pabbar, a smaller but perennial stream, flowed in a more distant valley to the east. The Satluj was the favourite, of course, but surveys showed taming it to generate power would have been too expensive.

(The Satluj at Tattapani, near Chaba, in August 2006)

“One of Messrs Siemens’s engineers has been examining the project for drawing the requisite power from Sutlej; but on account of the expense this project is likely to be given up in favour of another, which would draw the power from the municipal waterworks,” a trade journal called ‘The Electrical Engineer’ reported in 1892.

Waiting for an investor

Shimla’s municipal waterworks was based on a small stream called Nauti Khad. Major General Beresford Lovett and Arthur Pook had made a plan to generate electricity from it in the 1890s, but work didn’t start on it for almost 10 years as no private investor showed interest.

“The development of such proposals has been hampered by the difficulty of finding capital for the purpose, whether in India, in Europe or in America,” says

the journal ‘Electrical World’ of July 1-December 30, 1909.

Tired of the delay, the government decided to hand over the work to the Shimla municipality, and construction finally started right after the monsoon in 1909.

Although Nauti was close to Shimla, the powerplant had to be built at a lower height for the water to gather speed to drive the turbines. So, a site was selected at Chaba, on the left bank of the Satluj.

Not ambitious enough

Looking back, it was a short-sighted plan. Based on their then current power requirement, the British thought generating 350kW at Chaba would suffice. Their surveys had shown that Nauti Khad had enough water to

produce 745kW “even without damming or collecting water by reservoirs”.

At the second All-India Sanitary Conference held in Madras (now Chennai), during November 11–16, 1912, Shimla officials had claimed: “The gaugings of the Nauti show that at the driest time of the year, we may expect 28 cusecs (cubic feet per second) flow.”

But time belied their calculations. By 1918–19, Nauti Khad’s ‘minimum perennial flow’ had reduced to 19 cusecs, and in the summer of 1932, “The minimum discharge in Nauti Khad fell to 7 cusecs during daytime and 12 cusecs at night as farmers were lifting water for irrigation.”

(The Chaba plant in operation, in May 2004)

Fortunately, just before construction started, the planners had decided to build a reservoir for the Chaba plant. They had also agreed to make the plant in two equal parts. There would be the initial 750kW plant with three generators of 250kW each, and then scope for adding three more turbines and generators for a total capacity of 1.5MW.

Nature poses a hurdle

When work on the plant started in 1909, the deadline was 1911. However, unstable slopes and other unexpected

difficulties delayed the work. Only one of the two tunnels that would have carried water down to the powerhouse was ready late in 1911.

The second tunnel had run into a wall of solid rock. Special drilling machines were needed, so two challenges arose. One, to build a road to the site, and two, to keep the machinery small and light enough for transportation on the backs of coolies.

The machinery had to be sent from London, but the India Office sat on the order for 6 months, and when instructions went out to send it as soon as possible, labour problems started in the UK and the machinery was delayed further.

A genius in charge

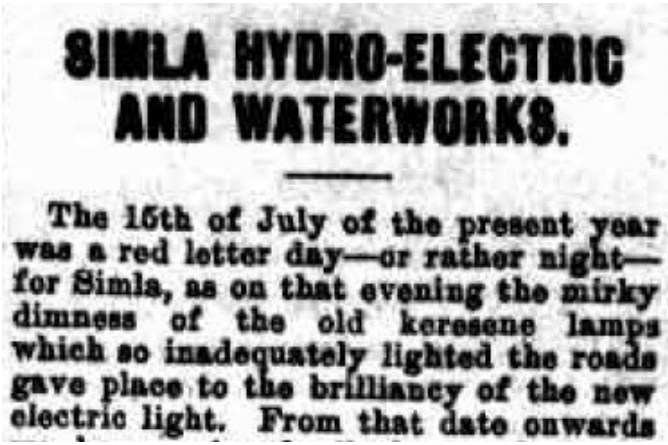
By this time Captain Basil Condon Battye of the Royal Engineers had taken

charge of the project. He is a very interesting historical figure. During the first World War he invented a hand grenade that became famous as the ‘Battye bomb’, and was used a lot in France. He also proposed and supervised the construction of the 48MW Shanan powerhouse on the Uhl river in Mandi district.

(Captain Basil Condon Battye of the Royal Engineers)

After almost four years of construction, the Chaba plant started producing electricity on July 15, 1913. It was a marvel of engineering at the time as roads had been built especially for it,

hills tunneled, one hilltop flattened, and a tank dug. Even with the imported machinery the project cost Rs 13,20,264, nominally the same as a small SUV these days.



SIMLA HYDRO-ELECTRIC AND WATERWORKS.

The 16th of July of the present year was a red letter day—or rather night—for Simla, as on that evening the murky dimness of the old keresene lamps which so inadequately lighted the roads gave place to the brilliancy of the new electric light. From that date onwards

Many aspirations bloom

The Chaba plant had opened with three generators producing a total of 750kW. Power from two generators (500kW) was reserved for the new “electrically-driven turbine pump” at Cherot, and the rest was used to fulfill people’s modern aspirations.

Starting in 1912, electric streetlights had been installed, and government buildings and private bungalows had been wired up. Each street pole was fitted with “one or two tungsten filament lamps, controlled at suitable spots by hand or automatic time switches.” The lamps produced light equivalent to LED lights of 7-10 watts each.

In the early days of municipal electricity, Shimla residents were charged one rupee per month for every light point in the house. The charges had to be paid regardless of whether the lights were used all day or not at all. Still, “quite a large number of shopkeepers on the Mall are already availing themselves of it.”

Along with electric lights, electric heaters also became popular rapidly. Initially, heaters were imported from Britain and were very expensive, but

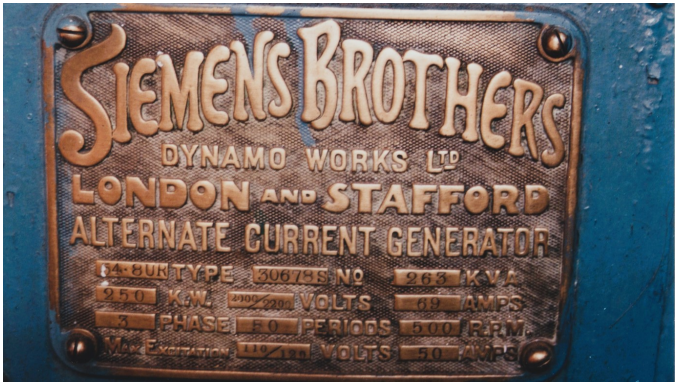
later FL Milne, an engineer with the Shimla electricity department, designed, patented and manufactured “radiators, water-boilers and several other types of heating apparatus” at “half to one-third of imported heaters”. The Shimla municipality offered special low rates on electricity for heaters to bring down the cost of heating to the level of coal fires.

(Old machinery at Chaba)

Dream of electric mobility

By 1914, there was talk of introducing electric cars also. Until then, the people of Shimla used to go about on

horseback or in rickshaws. Petrol cars were not suitable for the city's steep roads, but electric cars were expected to have better gradability.

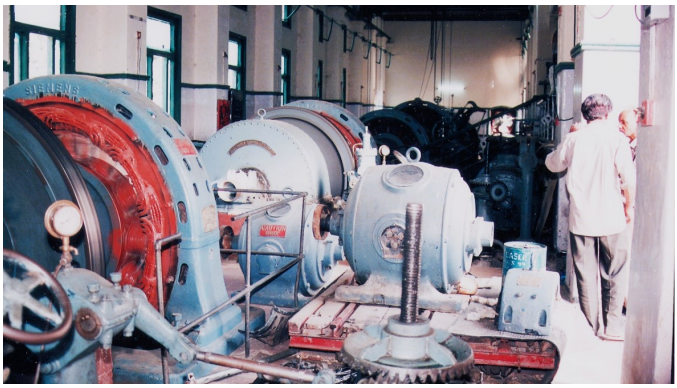


(The generators came from Siemens)

In 1915, Indian Engineering wrote: "There is no reason why small electric vehicles should not displace the rickshaw in hill stations, where these are in general use. Electric vehicles are now on the market that will take most of the gradients found in and about Simla."

The American journal 'Electric Vehicles' wrote in its January 1917 issue: "In view

of the attention now being given to the development of the electric automobile in this country, it is interesting to note that the matter is also exciting interest in Simla."



(The Chaba plant back in action in September 2000 after suffering damage in a flash flood a month earlier)

The plans for electric cars were surprisingly modern. Shimla's administrators thought the cars could be charged at night when demand for electricity fell. Battye proposed an electric car that would be 10.5 feet long and 5 feet wide – slightly larger than the hill rickshaws. With a 10-horsepower

motor it would carry “two people and a third on the dicky seat” and climb “any hill in Simla over which the wheels could obtain a grip,” He also proposed having a removable battery in the car – the same idea is today known as “battery swapping”.

Insatiable appetite for power

The cars didn’t materialise but Shimla’s hunger for electricity went on increasing. The Chaba plant’s 750kW output was inadequate by April 1916. So, a fourth generator of 500kW was installed. Another 500kW generator was added in the 1920s. The proposed sixth generator was never installed as Nauti Khad’s water flow had reduced.

The water in the Nauti reservoir had been enough to run the 750kW powerhouse for eight hours, but as the capacity increased to 1.75MW, it was

just enough for three hours and 20 minutes.

(Five control valves for the five turbines at Chaba. The proposed sixth turbine was not installed)

I have been to the Chaba plant thrice – in September 2000, May 2004 and June 2016 – and seen its turbines running. It's a pleasure to watch the ageless machines spin and roar under the care of the powerhouse staff. Chaba's output may be negligible compared with Shimla's needs but it's a living reminder of the summer capital's tryst with electricity.

(View of Chaba in June 2016. The Satluj's level had risen because of Kol Dam downstream)

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